

## PATENT

FRENCH PETROLEUM INSTITUTE

PROCESS AND DEVICE FOR PRODUCTION OF ELECTRICITY IN A FUEL CELL  
BY OXIDATION OF HYDROCARBONS FOLLOWED BY A FILTRATION OF  
PARTICLES

Invention by Eric LENGLET, Pierre BOUCOT, Gérard MARTIN

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**ABSTRACT**

Process for the production of electricity in which a hydrocarbon stream 1 and an air stream 2 are reacted in a partial oxidation chamber 3, whereby the operating conditions are:

- Dwell time in the chamber of between 100 and 1200 milliseconds
- Output temperature of the chamber of between 1150 and 1650°C
- Pressure of the chamber of between 0.1 and 1.5 MPa.

The amount of soot contained in the effluent is less than 0.1% by weight relative to the feedstock. The effluent of the chamber is cooled, and it is circulated in a soot recovery zone that comprises a first circuit 6 comprising at least a first filter 7 and a second circuit 41 that are mounted in parallel, and during a

period of time, a soot filtration stage of the effluent is carried out in the first filter which has a filtration surface area/useful volume ratio of between 80 and 5000 m<sup>-1</sup>. For another period of time, the first filter is regenerated in the presence of oxygen, and the cooled effluent is circulated in the second circuit. An effluent that is exiting from the hydrogen-rich recovery zone is recovered, and a fuel cell 10 of this effluent is fed.

Figure 1 to be published.